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NOTES ON TWO GENERA OF AMERICAN FLIES OF THE
FAMILY TRYPETIDAE

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THIS paper presents notes on the species of the genera *Trypanea* and *Neaspilota*, including those described by Coquillett and Benjamin, the types of these being in the collection of the United States National Museum in Washington.

Genus TRYPANEA Schrank

1795. *Trypanea* SCHRANK, Naturhistorische und ökonomische Briefe über das Donaumoos, p. 147.

It is known that there are a number of exotic species of *Trypanea* that show rather marked sexual dimorphism, but there are no records of such cases in America. In several species there are just as marked distinctions between the sexes as are met with in other regions and these are dealt with below. Unfortunately there are comparatively few records of food habits of the larvae, but what I have been able to gather from all sources are included herein.

The genus as accepted by me contains species with the following characters:

Characters of the genus.—Head not exceptionally elongated, usually a little longer than high, with the frons flattened and longer than its width at vertex, narrowed slightly in front, the inner pair of vertical bristles the longest on the head, the outer pair very much shorter; supraorbitals two in number, the upper one short and yellow; infraorbitals usually three pairs, the anterior pair usually much the shortest and sometimes not developed, usually dark colored, and

incurved. The frontal bristles usually much shorter and weaker in the male than in the female. Antennae short, the third segment not twice as long as its width at base, with the lower apical angle rounded, the upper one rather acute, the arista subnude; proboscis short and stout; palpi normal. Thorax with the usual two pairs of dorsocentral bristles, the anterior pair near the suture; the prescutellar acrostichals undeveloped; scutellum usually with but the basal pair of bristles present, the disk centrally bare, the sides short haired. Wing always with a large preapical black mark that emits a number of rays of variable width and extent, the third vein sometimes with some microscopic hairs above basally and more extensively below. Legs normal, mid femur sometimes with bristles on the ventral or anterior surface in at least the males of some species, the hind tibia with usually some microscopic anterodorsal setulae.

Several species of very similar appearance to the typical forms have been removed from the genus by different writers because they have a pair of short apical bristles on the scutellum and but two pairs of incurved infraorbital bristles on the frons. I disregard these two characters as generic criteria as the apical scutellars are sometimes very small, and in some typical species of *Trypanea* the anterior pair of infraorbitals is very minute or even lacking in particular specimens. I believe by following this rule we may arrive at a better understanding of the genus.

In almost all the species with the characteristic starlike preapical black mark on the wing there is a small, round, hyaline mark or spot immediately below the extreme tip of the second vein, whereas in the other group of species in which there are numerous brown marks on the basal half of the wing there is no small spot at this point, but instead there is one above the tip of the second vein. If the position of this spot and the type of the other wing markings are accepted as generic criteria, rather than the bristling of the frons and the scutellum, then it appears to me that we have a more natural arrangement of the species involved. This course is therefore adopted herein.

KEY TO THE SPECIES OF TRYPANEA

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 1. Males ----- | 2 |
| Females ----- | 20 |
| 2. Scutellum with four bristles, the apical pair much shorter than the basal. Scutellum with but one pair of bristles, the apical pair undeveloped.--- | 3 |
| 3. Two of the dark rays across the apical half of the discal cell of the wing extending over the fifth vein, the outer one attaining the wing margin, and a small hyaline spot at apex of the second vein (fig. 1, a)----- | eugenia (van der Wulp) |
| One dark ray across the apical half of the discal cell, which extends over the fifth vein to the wing margin, and a large wedge-shaped hyaline mark beyond the apex of the second vein (fig. 1, b). | stigmatica (Coquillett) |

4. Fore tarsus short and stout, the basal segment not over twice as long as thick, with some erect, outstanding, stiff hairs on the ventral surface, sometimes projecting forward below the surface of the second segment, and the intermediate segments between it and the fifth usually with outstanding hairs on their anterior edges that are a little longer than the segments; fore tibia rather thicker than usual and with a series of minute erect stiff hairs on the dorsal surface.--- 5
- Fore tarsus not abnormal in form or armature, the basal segment at least three times as long as thick, the other segments without outstanding anterior hairs and the fore tibia not thickened and with much less obvious dorsal hairing.----- 7
5. A complete oblique rather slender dark brown ray from the costal margin of the stigma to the inner cross vein, and two partial dark rays across the apical third of the discal cell of the wing.
ageratae Benjamin
- No complete dark ray from stigma to inner cross vein, and only one dark ray across the apical third of the discal cell.----- 6
6. Stigma yellow (fig. 1, *d*)----- *peruviana*, new species
 Stigma with a dark mark across its middle that extends into the marginal cell (fig. 1, *e*)----- *eclipta* Benjamin
7. Third antennal segment black, basal two segments yellow; wing with a large subquadrate black mark filling the entire stigma and extending back to third vein on the field of the wing that emits a narrow line on that vein to connect with the narrow black border of the inner cross vein, and no complete Y-shaped black mark at apex emanating from the large preapical black mark to cover apices of the third and fourth veins (fig. 1, *f*); mid femur with one or two rather strong anteroventral bristles beyond middle.----- *nigricornis* (Coquillett)
- Antennae entirely yellow; wing markings not as above.----- 8
8. Apex of wing whitish hyaline, without a Y-shaped black mark emanating from the large preapical black mark to cover the apices of the third and fourth veins.----- 9
- Apex of wing with a black Y-shaped mark emanating from the large black preapical mark, the arms of which end on the apices of the third and fourth veins.----- 12
9. Mid femur without outstanding anterior bristles; a slender brown streak or ray extending from the costal margin of the stigma to the inner cross vein (fig. 1, *g*)----- *imperfecta* (Coquillett)
- Mid femur with some very short bristles on the central portion of the anterior and a number of much longer bristles on the apical half of the anteroventral surface.----- 10
10. A broad black band extending obliquely from costal margin of the stigma to the inner cross vein, and a narrow black border on fifth vein from the anterior of the two dark rays across the apical half of the discal cell to base of that cell (fig. 1, *i*)---- *femoralis* (Thomson)
- At most a narrow oblique dark ray from the stigma to the inner cross vein and no dark border on fifth vein basally.----- 11
11. Stigma yellowish, the costal vein black on basal half or more of the stigma (fig. 1, *j*)----- *radifera* (Coquillett)
- Stigma hyaline, with a rather broad oblique black streak across it from anterior costal angle to near apical posterior angle (fig. 1, *l*).
microstigma Curran

12. Apices of submarginal and first posterior cells entirely brownish black, the stigma and basal portion of the wing except extreme base yellowish (fig. 1, *n*)..... conjuncta (Adams)
Submarginal cell usually with a small hyaline dot or spot below the apex of the second vein, and the first posterior cell always with a large lunate apical hyaline mark that extends almost entirely across its tip..... 13
13. A broad black band covering almost the entire stigma that is centrally broader than the first costal hyaline mark beyond it, and extending obliquely inward to cover the inner cross vein (fig. 1, *o*), frequently no small hyaline spot below the apex of the second vein; mid femur with bristles on the anteroventral surface apically... bisetosa (Coquillett)
At most a narrow dark streak or ray extending from the stigma to the inner cross vein..... 14
14. Dark ray through the discal cell immediately proximad of the outer cross vein continued over the fifth vein to the wing margin (fig. 1, *t*).
dacetoptera Phillips
No dark ray through the apical section of the discal cell extending over the outer cross vein..... 15
15. The slender dark streak or ray from the stigma to the inner cross vein entire or almost so, at most slightly paler within the inner edge of the stigma, fifth vein usually with a small dark spot near middle of the discal cell that is sometimes visible only when the wing is viewed from the tip against the light as a darker part of the vein itself (fig. 1, *x*); frontal bristles short, the ocellars not attaining the bases of the upper infraorbitals; mid femur with distinct anterior bristles on apical half..... actinobola (Loew)
Slender dark streak or ray from stigma to inner cross vein more or less widely interrupted, or the other characters not as above..... 16
16. Mid femur without anterior or anteroventral outstanding bristles..... 17
Mid femur with one to several rather strong bristles on the apical half of the anteroventral surface..... 18
17. Two dark rays or fasciae through the apical half of the discal cell of the wing that extend to or beyond the middle of the cell (fig. 1, *r*), usually a dark spot on the fifth vein below the anterior ray; ocellar pair of bristles short, not attaining to the bases of the upper infraorbitals..... texana, new species
Only one dark ray or fascia through the apical third of the discal cell that extends to or almost to the fifth vein, and sometimes a much shorter stump of one in front of it (fig. 1, *s*), no dark spot on fifth vein near middle of the discal cell; ocellar bristles long, attaining to bases of upper infraorbital pair..... mevarna (Walker)
18. Mid femur with several rather long, strong, yellowish bristles on the apical half of the anteroventral surface; ocellar bristles short, not attaining to bases of the upper pair of infraorbitals... actinobola (Loew)
Mid femur with but one or two dark brown bristles on the apical half of the anteroventral surface; ocellar bristles longer and stronger, attaining to or almost to the bases of the upper pair of infraorbitals... 19
19. The dark ray almost invisible through the stigma; third wing vein with some widely separated short stiff hairs on its underside from base to beyond the inner cross vein..... microsetulosa, new species
The dark ray faint but evident through the stigma; third wing vein with at most one or two short hairs at extreme base below.
californica, new species

20. Scutellum with four bristles, the apical pair much shorter than the basal. Scutellum with but one pair of strong bristles, the short apical pair lacking ----- 21
21. Two of the dark rays across the apical half of the discal cell of the wing extending over the fifth vein, the outer one reaching the wing margin (fig. 1, *a*)----- eugenia (van der Wulp) 22
 One dark ray across the apical third of the discal cell of the wing extending to the wing margin (fig. 1, *b*)----- stigmatica (Coquillett)
22. The preapical starlike mark on the wing extremely pale and faint, yellowish, centrally, only the tips of the rays in the wing margin readily visible (fig. 1, *w*)----- erasa, new species
 The preapical starlike mark on the wing black or blackish brown and conspicuous ----- 23
23. A broad black band extending from the costal margin of the stigma, almost or entirely filling the stigma, obliquely downward and backward to connect with the large preapical black mark and enclosing the inner cross vein----- 24
 At most a slender diagonal black or dark brown ray extending from the costal margin of the stigma, not filling the latter, to the large preapical black mark, and connecting with it at the inner cross vein, sometimes no diagonal ray present----- 25
24. Third antennal segment not darker than the basal two. bisetosa (Coquillett)
 Third antennal segment distinctly darker than the basal two. nigricornis (Coquillett)
25. Two dark rays or fasciae through the apical half of the discal cell of the wing in front of the one enclosing the outer cross vein extending well over the fifth vein, the outer one to the wing margin (fig. 1, *v*). arizonensis, new species
 At most only one dark fascia in the apical half of the discal cell of wing extending over the fifth vein----- 26
26. The dark fascia or ray through the discal cell nearest to the outer cross vein extending over the fifth vein to the wing margin (fig. 1, *t*). dacetoptera Phillips
 No dark ray through the discal cell extending to the margin of the wing_ 27
27. A complete narrow black diagonal ray extending from the costal margin of the stigma to the inner cross vein----- 28
 A partial or broken dark ray extending over part of the course between the stigma and the inner cross vein, or no ray present, when almost entire it may be broken only in the stigma or in the cell below it---- 35
28. Two dark subequal rays in the apical half of the discal cell of the wing, the inner one sometimes broken and represented by a dark spot on the fifth vein (fig. 1, *r*)----- texana, new species
 One dark ray through the apical third of the discal cell, sometimes a short stump of an anterior one against the fourth vein close to the inner cross vein, the dark dot when present close to middle of the discal cell, or the fifth vein with an elongate dark border on central third or more----- 29
29. The hyaline mark near the base of the first posterior cell of the wing and directly above the outer cross vein subquadrate, extending entirely across the cell (fig. 1, *h*)----- imperfecta (Coquillett)
 The hyaline mark near base of the first posterior cell of the wing almost directly above the outer cross vein not extending entirely across the cell and more or less definitely rounded above----- 30

30. Hind coxae black, densely gray dusted..... species A¹
 Hind coxae yellow and not densely gray dusted..... 31
31. Apex of the anterior basal cell of the wing rather broadly dark brown;
 fifth vein with a small dark spot near middle of the discal cell
 (fig. 1, *q*)..... vicina (van der Wulp)
 Apex of the anterior basal cell of the wing not dark brown, sometimes
 with faint fuscous marks; if narrowly dark brown there is a long
 dark streak on the fifth vein centrally..... 32
32. An elongate black streak on fifth vein centrally..... 33
 Only a small dark spot or no dark mark at centre of section of fifth
 vein on the discal cell..... 34
33. Apex of the anterior basal cell of the wing dark brown.... wheeleri Curran
 Apex of the anterior basal cell of the wing not distinctly browned.
 jonesi Curran
34. The streak through the stigma black or dark brown.... actinobola (Loew)
 The streak through the stigma yellowish brown or lacking centrally.... 35
35. Stigma with a deep black subquadrate mark in basal costal angle, and
 the fifth vein with a blackish streak along central third or more
 (fig. 1, *m*)..... microstigma Curran
 Stigma with a rather indistinct brown continuation of the diagonal
 streak through it that is blackened on costal and hind margins where
 it touches the veins, or the ray is complete through the stigma and
 broken below it..... 36
36. A dark brown streak obliquely through the stigma extending to, or
 almost to, the hind margin of the submarginal cell, and no definite
 dark ray from that point to the inner cross vein (fig. 1, *e*).
 eclipta Benjamin
- At least a partial dark ray from inner cross vein to the stigma..... 37
37. No dark mark on the fifth vein near middle of the discal cell, and one
 or two fuscous marks in the apex of the anterior basal cell
 (fig. 1, *s*)..... mevarna (Walker)
 A dark spot on the fifth wing vein near middle of the discal cell..... 38
38. Apex of anterior basal cell dark brown (fig. 1, *q*).... vicina (van der Wulp)
 Apex of anterior basal cell not dark brown..... 39
39. Apex of anterior basal cell entirely hyaline, diagonal dark ray inter-
 rupted below stigma (fig. 1, *k*)..... radifera (Coquillett)
 Apex of anterior basal cell with a small fuscous spot near inner
 cross vein..... 40
40. Third wing vein with one or two weak hairs at base below.
 californica, new species
 Third wing vein with minute hairs below from base to inner cross
 vein..... microsetulosa, new species

¹ This, I believe, will prove to be a new species, but since the materials are unsatisfactory as a basis for description it is here left in doubt.

FIGURE 1.—*a*, *Trypanea eugenia* (after van der Wulp); *b*, *T. stigmatica*, type; *c*, *T. ageratae*, type; *d*, *T. peruviana*, type; *e*, *T. eclipta*, type; *f*, *T. nigricornis*, type; *g*, *T. imperfecta*, type, male; *h*, *T. imperfecta*, female; *i*, *T. femoralis*, male; *j*, *T. radifera*, type, male; *k*, *T. radifera*, female; *l*, *T. microstigma*, male; *m*, *T. microstigma*, female; *n*, *T. conjuncta*, male; *o*, *T. bisetosa*, male; *p*, *T. bisetosa*, female; *q*, *T. vicina*; *r*, *T. texana*, types; *s*, *T. mevarna*; *t*, *T. dactoptera*; *u*, *T. jonesi*, female; *v*, *T. arizonensis*, type; *w*, *T. erasa*, female; *x*, *T. actinobola*.

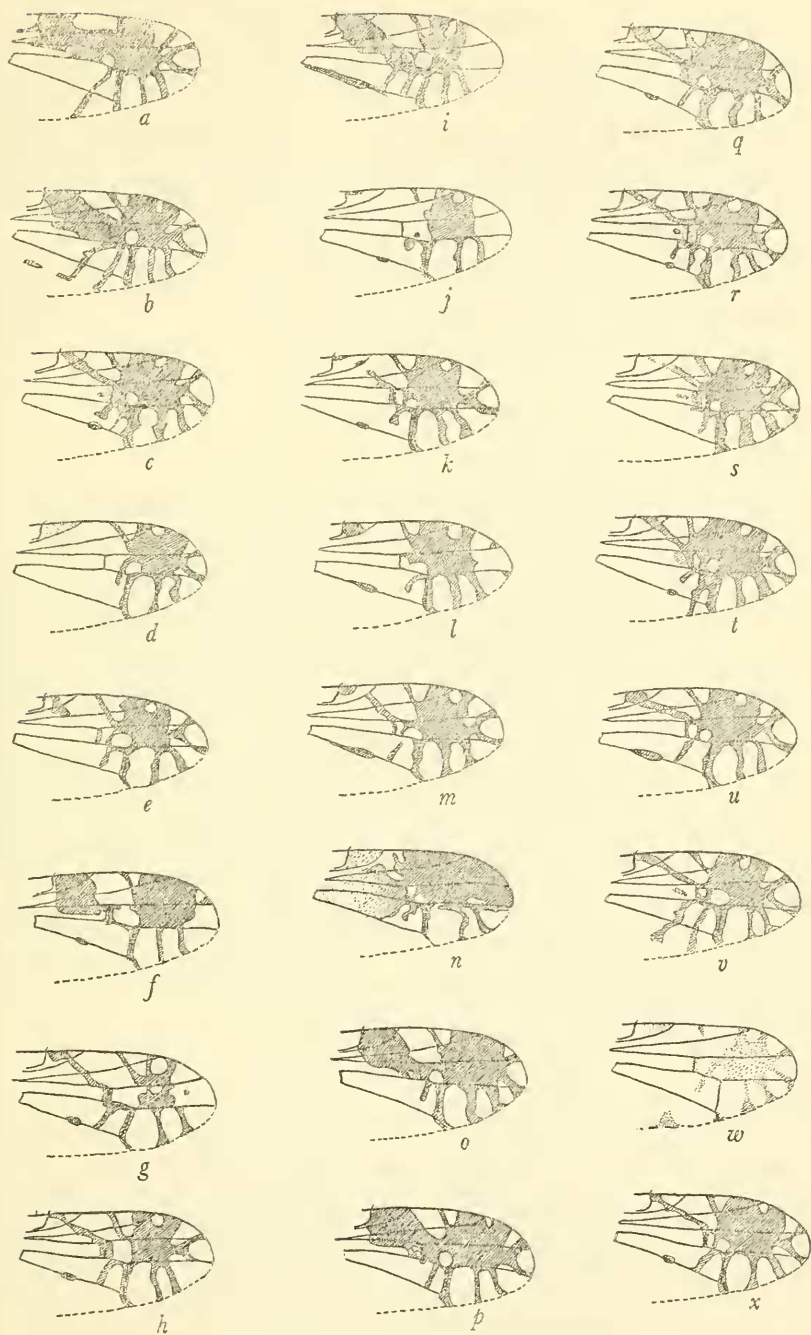


FIGURE 1.—WINGS OF SPECIES OF TRYPANEA

(For explanation see opposite page)

TRYPANEA EUGENIA (van der Wulp)

1900. *Urellia eugenia* VAN DER WULP, *Biologia Centrali-Americana*, Diptera, vol. 2, p. 427, fig.

This species, which is unknown to me, is described as differing from all others in the genus by its rufous coloration and the extension of the black spots on the wings, thorax and abdomen grayish, but appearing rufous on account of a dense ochraceous dust, and with short yellow hairs. The wing markings are distinctive though of the same general type as in *stigmatica* and a few others not at that time known to van der Wulp (fig. 1, *a*).

Described from Guerrero, Mexico.

TRYPANEA STIGMATICA (Coquillett)

1899. *Urellia stigmatica* COQUILLET, *Journ. New York Ent. Soc.*, vol. 7, p. 266.

This species differs from all the others contained in this paper except *eugenia* in having a short pair of apical scutellar bristles and the wing markings as in figure 1, *b*. There is some variation in the extent of the two dark rays that cross the discal cell, the normal type being that figured but sometimes there are other fainter markings basally and the small mark in front of the anterior inner ray may be connected with the latter, with one or two minute hyaline dots in the disk of the large black preapical mark.

The most remarkable variation from type is seen in a female specimen from Nevada, which has a rather wide fuscous cloud from the anterior ray along the fifth vein to its base, and the posterior ray just in front of the outer cross vein ceasing at the fifth vein. There is a possibility that this may be a distinct species.

Originally described from Colorado, from which State there is another specimen in the National Museum collection, as well as others from New Mexico, California, Texas, and Idaho. The Bryant collection contains specimens from Arizona.

TRYPANEA AGERATAE Benjamin

1934. *Trupanea ageratae* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 56, fig. 40.

This species was described from a unique male, now in the collection of the National Museum (No. 54386), that was reared from a larva feeding in the flowers of *Ageratum littorale* on No Name Key, Fla. Wing as in figure 1, *c*.

TRYPANEA PERUVIANA, new species

Male.—Very similar to *eclipta* in most respects, differing from it in having the basal segment of the fore tarsus about twice as long

as thick, with some downwardly directed dark hairs at base of the ventral surface that are longer than the diameter of the segment, less evident hairs on the anterior side of the intermediate segments, the fore tibia more swollen and with the dorsal series of erect hairs more distinct and decidedly stronger. There are no outstanding bristles on the anterior surface of the mid femur. The wing pattern differs also in having only a yellow suffusion in the stigma and no appreciable cloud on the inner cross vein (fig. 1, *d*).

Length, 2 mm.

Type and one paratype male, Arequipa, Peru, August 21 (Cockereil), U.S.N.M. No. 54385.

TRYPANEA ECLIPTA Benjamin

1934. *Trypanea eclipta* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 57, fig. 42.

1914. *Trypanea metoica* HENDEL, Abh. Ber. Zool. Mus. Dresden, vol. 14, p. 79. (?)

The male of this species has the fore tarsus shorter and stouter than in the other species except the two immediately above, with fine outstanding hairs on the anterior edge of the second to fourth segments, some of them distinctly longer than the width of the segments, the basal segment thickened and but little longer than wide, with a tuft of stiff yellow hairs on the underside at apex that projects forward against the ventral surface of the second segment. The fore femora in all three species of this group are thickened and have a few very short posteroventral bristles on the apical half, while the mid femur lacks the anteroventral bristles and has the anterior central series almost undeveloped.

In a few specimens there are one or two microscopic hairs on the third wing vein below about midway between the base and the inner cross vein, and in more there are one or two hairs at base below that are sometimes yellow.

Wing markings usually as shown in figure 1, *e*, a dark fascia near apex of the discal cell, but sometimes this is reduced to a mere spur against the fourth vein. In a few specimens there are a number of minute hyaline dots in the large black preapical mark, and in no case is the dark discal mark connected with the latter by a diagonal ray.

Locality, Orlando, Fla., August–November, reared from larvae feeding in flowers of *Eclipta alba*, by D. J. Nicholson.

Holotype, allotype, and 178 paratypes, U.S.N.M. No. 54383. Benjamin states that he had, besides the holotype and allotype, 170 paratypes, but there are 178 in the collection.

TRYPANEA NIGRICORNIS (Coquillett)

1899. *Urellia nigricornis* COQUILLET, Journ. New York Ent. Soc., vol. 7, p. 266.

Described from a male in the National Museum collection taken in Colorado.

The third antennal segment is deep black in the male, but in the females I have examined this segment is not much darker than the basal two. The frontal bristles in the male are much shorter than those of the female, the ocellars not attaining to the bases of the upper pair of infraorbitals, and the wing markings are as in figure 1, *f*.

The male has some well-developed anteroventral bristles on the apical half of the mid femur. In both sexes all the hairs and bristles on the abdomen are whitish yellow. Third wing vein with at most one or two hairs at extreme base below.

Represented in the National Museum collection by specimens from Idaho, Wyoming, and Utah. In the Bryant collection there are specimens from Arizona.

TRYPANEA IMPERFECTA (Coquillett)

1902. *Urellia imperfecta* COQUILLET, Journ. New York Ent. Soc., vol. 10, p. 181.

Originally described from a male specimen taken at Williams, Ariz. There is a female in the National Museum collection from the same locality and with the same data, but Coquillett did not associate this specimen with the type male.

I figure the wing of the latter and also that of the female to show the sexual differences in markings (figs. 1, *g*, *h*).

The fore tarsi of the male are normal in form and armature, the basal segment being at least three times as long as thick, there are no well-developed bristles on the anterior surface of the mid femur in either sex, and the frontal bristles of the male are very much shorter than those of the female. I can detect only one or two minute stiff hairs at the base of the third wing vein above and below.

There are only the above mentioned two specimens in the National Museum.

TRYPANEA FEMORALIS (Thomson)

1868. *Trypeta femoralis* THOMSON, Kongliga Svenska Fregatten Eugenie Resa Omkring Jorden, Diptera, p. 532.

There is a male specimen in the National Museum collection from Santa Clara, Calif., identified by Coquillett as this species that I accept as correctly identified.

It belongs to the group in which the Y-shaped black mark at the apex of the wing is undeveloped, the tips of the third and fourth veins being unclouded (fig. 1, *i*). The extension of the black mark

along the fifth vein to its base is unique in this group except in the case of the single aberrant female mentioned under *stigmatica*. The mid femur has some rather strong anteroventral bristles beyond the middle, as mentioned by Thomson.

The specimen is but 3 mm. in length; Thomson gives 4 mm. as the length of his specimen.

Original locality, California.

TRYPANEA RADIFERA (Coquillett)

1899. *Urellia radifera* COQUILLETT, Journ. New York Ent. Soc., vol. 7, p. 267. (Male.)

1932. *Trypanea hebes* CURRAN, Amer. Mus. Nov., No. 556, p. 9, fig. 7. (Female.)

I figure the wing of the male and female (fig. 1, *j, k*).

The male has the frontal bristles much shorter than does the female, the ocellars not extending quite to the bases of the upper pair of infraorbitals, the mid femur with a number of dark anteroventral bristles on the apical half that increase in length as they advance toward the apex, and the apical Y-shaped mark on the wing undeveloped.

The female has no strong anteroventral bristles on the mid femur and the black apical Y-shaped mark on the wing is entire. There are frequently some microscopic setulae from base to near inner cross vein on the underside of the third wing vein, and the brown mark on the fifth vein near middle of the discal cell is usually more elongate in the female than in the male.

There can be no question of the association of the sexes as I have a pair taken in copula by me at Medicine Hat, Alberta.

Originally described from Tucson, Ariz., and in the National Museum collection there are specimens from New Mexico, Colorado, Texas, Idaho, South Dakota, and Alberta.

TRYPANEA MICROSTIGMA Curran

1932. *Trypanea microstigma* CURRAN, Amer. Mus. Nov., No. 556, p. 7, fig. 8. (Female.)

The male has the black Y-shaped mark at apex of the wing undeveloped, sometimes represented by black dots at apices of the third and fourth veins as in figure 1, *l*, while the female has this mark usually entire as in figure 1, *m*. The black stigmal mark is larger in the male than in the female, extending entirely across the cell.

In the male there are several rather strong blackish bristles on the anterior surface of the mid femur that are as in the other species having such bristles almost on the anteroventral surface of apical half, and as usual in this section of the genus the frontal bristles are much shorter in the male than in the female.

Originally described from two females taken at Crater Lake, Oreg. In the National Museum collection there are specimens from the following localities: Wells, Nev.; Tuttle and Oakley, Idaho; Mount Hood, Oreg.; Ellery Lake, Pine Lake, and Adelanto, Calif. The two Idaho specimens bear numbers 10 and 10b, with the name "*S. pestifer*" (D. E. Fox) on the label.

TRYPANEA CONJUNCTA (Adams)

1904. *Urellia conjuncta* ADAMS, Kansas Univ. Sci. Bull., vol. 2, pp. 450, 451-452.

Originally described from a female taken at Bill Williams Fork, Ariz. I am describing below the male of the species.

Male.—Differs from all the known North American species of the genus in the reduction of the number of hyaline marks in the margin of the wing, the entire costa from the middle of the marginal cell to just below the apex of fourth vein being entirely brownish black (fig. 1, *n*). The frons is remarkable not only in the very weak and short bristles, but in having five or six pairs of fine, short, and exceptionally closely placed incurved infraorbitals.

The fore tarsi are shorter than usual, but the basal segment is at least three times as long as thick and there are no exceptional hairs on the intermediate segments, the midfemur has no well-developed anteroventral bristles on the apical half, the hind tibial series of setulae is weak, and there are a few microscopic hairs on the basal section of the third vein on its underside. Length, 4 mm.

White Mountains, Ariz., July 7, 1933 (O. Bryant collection).

TRYPANEA BISETOSA (Coquillett)

1899. *Urellia bisetosa* COQUILLET, Journ. New York Ent. Soc., vol. 7, p. 266.

This species is readily distinguished from any other but *nigricornis* in the group with but two scutellar bristles by the broad black band that extends from the costal margin of the stigma obliquely backward to the inner cross vein (fig. 1, *o, p*).

The male is at once distinguished from that of *nigricornis* by the entirely yellow antennae, but the female is not so readily distinguished as it has the antennae sometimes entirely yellow or at most has the third segment brownish and not black. Only one or two hairs are present at the extreme base of the third vein below in both sexes.

The species was originally described from a female from Las Cruces, N. Mex., and a male from Marysvale, Utah.

The female is labeled "Type," but there are a male and a female from Marysvale that have no type labels on them, and apparently the male is the one listed by Coquillett. It is unquestionably a male of *nigricornis*, but it is in fragmentary condition and the antennae are missing.

There are many specimens of both sexes in the National Museum collection from Torreón and Tlalmalilo, Mexico, and a few from California, Colorado, Idaho, New Mexico, and Nevada.

TRYPANEA VICINA (van der Wulp)

1890. *Urellia vicina* VAN DER WULP, *Biologia Centrali-Americana*, Diptera, vol. 2, p. 427, fig.

Very similar to *actinobola* in most characters, but the apex of the anterior basal cell of the wing is dark brown (fig. 1, *q*). Structurally the male differs from that of Loew's species in having the frontal bristles longer and stronger, the ocellar pair attaining to the bases of the upper infraorbital pair, and the mid femur with no outstanding anteroventral bristles on the apical half. There are also usually some microscopic hairs on the underside of the third wing vein from base to near the inner cross vein.

Originally described from two females from Orizaba, Mexico. In the National Museum there are a male from Brewster County, Tex., one female from Victoria and one from Devils River, Tex., and two females from San Francisco, Calif.

TRYPANEA TEXANA, new species

Male and female.—This species agrees very closely with the description of *polyclona* (Loew), which is unknown to me and not included in this paper. It is said by Loew to have two pairs of scutellar bristles and must belong with *stigmatica* and *eugenia*. The present species is very similar to that figured by van der Wulp as *polyclona* in 1890 (p. 427), but in no case in the series before me is the anterior one of the two dark rays through the discal cell entire. In every specimen this ray is broken before it reaches the fifth vein, usually being represented on the vein by a dot; the other ray is also usually broken beyond middle of the cell, but in two specimens it is entire (fig. 1, *r*).

The male has the frontal bristles short, the ocellars not attaining to bases of the upper infraorbitals, and in neither sex are there anteroventral bristles on the mid femora. The third wing vein has hairs below from base to near the inner cross vein.

Length, 3 mm.

Holotype male, Arlington, Tex., June 12, 1907 (Bishop); allotype and 6 female paratypes, Dallas, Tex., U.S.N.M. No. 54401.

A female specimen from Las Visayas, Chihuahua, Mexico, differs from the above in having the inner ray through the discal cell entire and carried along the fifth vein for a short distance but not to the bases of the discal cell. It is not *occidentalis* Adams.

TRYPANEA MEVARNA (Walker)

1849. *Trypeta (Urellia) mevarna* WALKER, List of the specimens of dipterous insects in the collection of the British Museum, pt. 4, p. 1023.
1862. *Trypeta solaris* LOEW, Monographs of the Diptera of North America, vol. 1, p. 84, pl. 2, fig. 19.
1934. *Trupanea mevarna* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 54.

Closely similar to *dacetopectera*, having the frontal bristles of the male long, the anteroventral bristles lacking on the mid femora, and the third wing vein with some widely separated hairs below from base to near inner cross vein in both sexes. The distinctions in both sexes are in the wing markings, particularly in the shorter dark fascia in front of the outer cross vein, which ceases at the fifth vein (fig. 1, *s*).

There is a photograph of the wing of Walker's type specimen in the National Museum that agrees with the wing of the species before me.

It is evident from a few aberrant specimens that *mevarna* and *dacetopectera* are more closely related to each other than they are to some other species, as the complete fascia through the discal cell is not an infallible distinguishing character; one specimen has it complete on one wing and ceasing at the fifth vein on the other, and in two specimens of *mevarna* there is a detached dark spot on the edge of the wing below the abbreviated fascia.

Walker's type came from Florida, Loew's type of *solaris* from Georgia.

There are many specimens of both sexes in the National Museum collection from a number of localities in Florida reared from larvae found feeding in the flowers and tender tips of plants of the genus *Chrysopsis*.

Records of the occurrence of this species from other localities should be checked to insure correct identification.

TRYPANEA DACETOPTERA Phillips

1923. *Trypanea dacetopectera* PHILLIPS, Journ. New York Ent. Soc., vol. 31, p. 148.
1934. *Trupanea dacetopectera* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 54, fig.

This species is readily distinguished from any other in the eastern United States by the continuation to the hind margin of the wing of the outer dark ray through the discal cell (fig. 1, *t*). The wing markings in the sexes are similar, and there is considerable variation in the extent of the dark markings in front of the inner cross vein in the apex of the anterior basal cell, and in the form of the dark markings in front of the complete dark ray through the discal cell.

In the male the frontal bristles are nearly as strong as in the female, the ocellars almost or quite attaining the bases of the upper

pair of infraorbitals. The mid femora lack well-developed bristles in both sexes, and the third wing vein is almost invariably sparsely haired below from its base to near the inner cross vein.

Originally described from New York and recorded from New England. The National Museum collection contains a large number of specimens from Orlando, Fla., all with one exception reared from larvae mining in *Gnaphthaliium obtusifolium*. The exception bears a label indicating that it was from *Chrysopsis microcephala*. This may be an error.

TRYPANEA JONESI Curran

1932. *Trypanea jonesi* CURRAN, Amer. Mus. Nov., No. 556, p. 6, fig. 6.

Described from female specimens and compared with *actinobola*, from which it was distinguished by the elongate dark mark on the fifth wing vein and the more extensively blackened stigma. The abdomen is also stated to be more shiny and the head distinctly shorter. These characters hold good for the specimens before me, and the anterior pair of infraorbital bristles are also longer than in Loew's species. Wing as in fig. 1, *u*.

I have seen no male that I can identify as belonging to this species.

Originally described from various localities in Oregon and from Jackson Lake, Wyo. In the National Museum collection there are three females with data as follows: Ormsby County, Nev. (Baker); National Park, Wyo.; and Pasadena, Calif. (Grinnell).

TRYPANEA ARIZONENSIS, new species

Female.—Similar to *dacetopectera* in general features, the thorax and abdomen densely gray dusted, the former without a trace of dark vittae, and the abdomen but slightly shiny, the antennae and legs tawny-yellow. In no specimen is there any trace of anterior bristles on the mid femur, and the third wing vein has usually two or more widely separated microscopic stiff hairs below between base and the inner cross vein.

Wings markings as in figure 1, *v*, readily distinguishing it from any other in this group, none having two dark fasciae through the discal cell that extend beyond the fifth vein. In *stigmatica* there are two similar fasciae, but in that species there is a broad black band between the stigma and the inner cross vein, and there are two pairs of scutellar bristles, the apical pair much shorter than the basal.

Length, 3 mm.

Type and 6 paratypes, Tucson, Ariz., February 25, 1934, lot 429 (O. Bryant collection).

TRYPANEA ERASA, new species

Female.—Head and legs dull testaceous-yellow, inner vertical, ocellar, and orbital bristles except the upper supraorbital yellowish brown, the latter and the other cephalic hairs and bristles yellowish white. Ocellars long, extending to bases of the upper pair of infra-orbitals, the infraorbitals in three pairs.

Thorax black, humeri and pleura paler, mesonotum densely lead-gray dusted, without dark vittae, humeri, pleura, and scutellum yellowish gray dusted. The strong bristles yellowish brown, others and the decumbent scalelike hairs whitish yellow.

Legs normal, yellowish testaceous including the hind coxae. Mid femora not bristled in front.

Wings grayish hyaline, with very faint dark markings as in figure 1. *w*, the central portion of the usual preapical star-shaped mark yellow, only the apices of the rays on the wing margin fuscous. Third vein bare or with at most one or two microscopic hairs at extreme base.

Abdomen colored as mesonotum, densely gray dusted, slightly shiny, sheath of the ovipositor glossy black, the hairs rather long and whitish yellow except on apex of the sheath.

Length, 2 mm.

Holotype, Lima, Peru, 1914 (Parish), U.S.N.M. No. 54384.

TRYPANEA ACTINOBOLA (Loew)

1873. *Trypeta actinobola* LOEW, Monographs of the Diptera of North America, vol. 3, p. 326.

1934. *Trupanca actinobola* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 56, fig. 41.

As at present accepted this may be a complex of closely related species, but intensive field and laboratory work is required to determine the status of specimens from different sections of the country and reared from different food plants.

The wing markings vary but little in the series before me, but the fifth vein has sometimes no dark spot near the middle of the discal cell (fig. 1, *x*). The frontal bristles of the male are short, and the mid femur of the same sex has a number of rather long bristles on the apical half of the anteroventral surface.

Originally described from Texas. I have before me specimens from Texas, New Mexico, California, Kansas, Arkansas, Indiana, Georgia, Florida, and Mexico.

Recorded food plants of the larvae are species of *Erigeron*, *Solidago*, *Aster*, *Coreopsis*, *Hieracium*, and *Actinospermum*.

TRYPANEA CALIFORNICA, new species

Male and female.—Very similar to *actinobola*, the wing pattern being almost identical, with the exception that the dark streak through the stigma is much less distinct.

The much longer and stronger frontal bristles, especially the ocellar pair that reaches the bases of the upper infraorbital pair, readily distinguish the male from that of the other species. There are one or two short stiff hairs at the base of the third vein on its underside.

Length, 2.5 mm.

Type male, allotype, and 2 paratypes, Emerald River, Tahoe, Calif., June 30, 1927 (Aldrich), U.S.N.M. No. 54399.

TRYPANEA MICROSETULOSA, new species

Male.—Agrees very closely with *californica* but has a widely spaced series of microscopic stiff hairs on the underside of the third wing vein from base to a little beyond the inner cross vein.

Length, 2.75 mm.

Holotype, Lakeside, Tahoe, Calif. (Aldrich), U.S.N.M. No. 54400.

TRYPANEA OCCIDENTALIS (Adams)

1904. *Urellia occidentalis* ADAMS, Kansas Univ. Sci. Bull., vol. 2, pp. 450, 452-453.

This species is unknown to me except from the description. It was described from both sexes. The male has the Y-shaped black mark on the wing developed; there are two black rays or fasciae through the apical half of the discal cell, the inner one connected with a dark border along the fifth vein to the base of the discal cell. I have found this marking present in only *femorialis* Thomson of this group, but in it the Y-shaped black apical wing mark is absent in the male, and the ray from the stigma to the inner cross vein is not so wide as the first posterior cell. There are several species that have two dark rays through the apical half of the discal cell, but none of this group known to me appears to be *occidentalis*.

TRYPANEA WHEELERI Curran

1932. *Trypanea wheeleri* CURRAN, Amer. Mus. Nov., No. 556, p. 7, fig. 1.

This species was described from females only and is very similar to *jonesi*, being distinguished therefrom only by having a narrow brown mark across the apex of the anterior basal cell of the wing against the inner cross vein. Curran's figure shows this brown mark as extremely narrow, there being very little difference between the figures of the wings of the two species.

Type locality, San Diego County, Calif.

I am accepting as this species a female that has the wings marked as in Curran's figure, but there is no subhyaline mark close against the posterior side of the inner cross vein, the apex of the anterior basal cell is more widely dark, and the brown mark on the fifth vein extends to the base of the discal cell. The hairs on the pleura and sides of the abdomen are orange-yellow, and the third vein is bare below.

Locality, Sierra Morena Mountains, Calif., April 2, 1906 (Aldrich coll.).

Genus NEASPILOTA Osten Sacken

1878. *Neaspilota* OSTEN SACKEN, Catalogue of the described Diptera of North America, ed. 2, p. 192. (As a subgenus of *Trypeta*.)

1910. *Neaspilota* COQUILLET, Proc. U. S. Nat. Mus., vol. 37, pp. 511, 574. (Type designated as *Trypeta alba* Loew.)

1934. *Neaspilota* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 34.

Benjamin, in the paper above referred to, described two species of the genus and gave a key to the described species that was based entirely upon color characters. He failed to label his species in the collection, and no type catalog numbers were given. I have sorted out his species, and numbers have herein been allotted them.

In no paper dealing with the genus is there any mention of the fact that the claws of the fore tarsi of the males are asymmetrical. The inner or anterior claw is much larger and stronger than the outer one in that sex, while there is no appreciable difference in the claws of the female. The upper supraorbital bristle is sloped inward in all the species.

I give below a key to the species, with added male characters that will augment the one given by Benjamin. The armature of the legs has not been previously used.

KEY TO THE SPECIES OF NEASPILOTA

1. Wing with several fuscous marks in addition to the one in the stigma: one in the marginal cell directly below the stigmal one and connecting with it, a more or less complete fascia from the costa before the apex of the second vein over the outer cross vein, a spot over the tip of the second vein and another over the tip of third, a cloud on the inner cross vein, and usually some fainter marks in the first posterior cell... 2
- Wing with at most the stigma distinctly blackened, no dark clouds through or in the other cells though sometimes the cross veins may be darker than connecting parts of the longitudinal veins..... 3
2. Hairs on the dorsum of the abdomen yellow; no distinct black mark on lower half of the sternopleura or on the centre of the anterior margin of the thorax; the fuscous mark near apex of the first posterior cell carried entirely across the cell..... *vernoniae* (Loew)

- Hairs on dorsum of the abdomen dark brown or black; lower half of the sternopleura and a mark in centre of the anterior margin of the thorax black; the fuscous mark near apex of the first posterior cell of the wing interrupted in middle of the cell..... achilleae Johnson
3. Hind tibia of the male with two minute erect stiff hairs at the apex on the anteroventral surface that project downward, the hind femur in same sex without erect hairs on the ventral surface, mid femur with short fine erect hairs basally; stigma of wing in both sexes with a distinct dark spot in basal third..... punctistigma Benjamin
- Hind tibia of the male without any short erect hairs at apex of the anteroventral surface; other characters not as above..... 4
4. Hairs on the dorsum of the abdomen except those on the basal compound tergite dark brown; stigma yellowish brown, usually paler behind; mid and hind femora of the male without erect outstanding ventral hairs; wing veins brown except at bases; interocellar region infuscated..... albidipennis (Loew)
- Hairs on the dorsum of the abdomen yellow; other characters not as above..... 5
5. Stigma entirely yellowish hyaline, and the veins entirely pale yellowish... 6
- Stigma entirely or basally browned or infuscated, the cross veins and a short section of the connecting veins each side of them usually darker than the central portions of the third and fourth veins..... 7
6. Mid and hind femora of the male with some fine outstanding hairs on the ventral surfaces, most noticeable basally; the series of minute setulae on the anterodorsal surface of the hind tibia practically undeveloped; stigma of the wing narrow..... dolosa Benjamin
- Mid and hind femora of the male without erect fine ventral hairs; the series of minute anteroventral setulae on the hind tibia well developed; stigma wide..... alba (Loew)
7. Stigma fuscous or brownish yellow on basal third or more, and the cross veins darker than the greater portion of the longitudinal veins; a slight dark cloud at base of the costal cell; mid and hind femora of the male not furnished with outstanding ventral hairs; the anterodorsal series of minute setulae on the hind tibia rather inconspicuous and not closely placed..... signifera Coquillett
- Stigma almost entirely fuscous or brown, paler behind; mid and hind femora of male not furnished with outstanding ventral hairs; hind tibia with the series of anterodorsal setulae stronger and more closely placed..... brunneistigma Doane

NEASPILOTA PUNCTISTIGMA Benjamin

1934. *Neaspilota punctistigma* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 38.

The describer, to avoid having a mixed-type series, restricted the type materials to the specimens reared from larvae feeding in *Pluchea foetida* and included besides the holotype male and allotype 70 paratypes, all from Florida localities. There are many other specimens in the collection.

Type, U.S.N.M. No. 54402.

NEASPILOTA DOLOSA Benjamin

1934. *Neaspilota dolosa* BENJAMIN, U. S. Dept. Agr. Techn. Bull. 401, p. 39.

The type materials were restricted by the describer to specimens reared from *Heterotheca subaxillaris* of which there are besides the holotype male and allotype 150 paratypes. There are many other specimens in the collection, all from Florida localities.

Type, U.S.N.M. No. 54403.